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521,189

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PROVISIONAL SPECIFICATION

Improvements in and relating to the Treatment of Foodstuffs

I, GEORG WILHELM HOMMEL, of German nationality, of 57-59, Victoria Street, Westminster, London, S.W.1, do hereby declare the nature of this invention to be as follows:—

This invention relates to the treatment of foodstuffs which are normally consumed in a boiled or otherwise cooked state and particularly to the treatment of vegetable foods and eggs.

The object of the invention is to provide a process of treating such foods with a view to obtaining a product which may be stored for long periods and will retain its nutritive and other properties, and in particular the properties due to the presence of vitamins in the material initially treated.

As is well known the vitamin content of food is liable to be reduced by the action of heat, the degree of destruction depending upon the temperature to which the material is treated and the time during which it is subjected to the action of heat.

Thus Vitamin A is known to be affected in this way as also are Vitamins B and C, the latter of which is soluble in water.

The invention consists, broadly, in subjecting foods of the character above indicated to boiling or steaming and evaporating operations effected under reduced pressure.

Thus, in accordance with the invention, these operations may be carried out under a pressure of 0.0728 atmospheres, the temperature of the material undergoing treatment being retained at 40° C. and during or subsequent to the boiling or steaming and evaporation treatments, the materials are subjected to irradiation with light rays in the visible and/or non-visible regions of the spectrum.

Normally, in accordance with the invention, the material is subjected to the boiling or steaming and evaporation treatments in a suitably divided state.

Thus, in the case of vegetables they may be cut up into small pieces.

If the amount of water present in the raw food treated is sufficient, the boiling or steaming operation may be effected without the addition of water.

Preferably, the irradiation is effected

while the material is subjected to reduced pressure, and thus during the boiling or steaming and evaporating operations.

Such irradiation may, for instance, be applied to increase the vitamin content of the material beyond that corresponding with the vitamin content of the material initially treated, or merely to replace that proportion of the vitamins or certain of the vitamins which may be destroyed during the boiling or steaming and evaporation treatments.

Conveniently, the visible rays included in the red to orange region of the spectrum are used for irradiation alone or in association with the light rays falling within other regions of the spectrum and including ultra-violet rays in greater or less proportions.

The irradiation will normally be effected by artificial light, and as a source of artificial light giving rays in the red to orange region of the spectrum, the white light produced from incandescent lamps having tungsten filaments may be employed.

Alternatively, white light approaching more nearly the character of sunlight may be used.

However, tungsten or other metallic conductors heated to a degree such that they will admit rays within the orange to red region of the spectrum, are used.

If it is desired to irradiate with ultra-violet light, electric lamps having envelopes of material highly permeable to these rays and, for instance, envelopes of quartz, may be used.

Thus, mercury-quartz lamps may be employed where it is desired to maintain or raise the content of Vitamins B, C and D in the material.

As will be understood, mixtures of foods of various kinds may be treated in accordance with the invention, to produce preparations which may be readily prepared by the addition of water or other liquid.

The following particulars are given by way of example to illustrate the application of the invention to the treatment of potatoes.

The potatoes are washed, peeled, and then boiled or steamed at a pressure con-

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AMENDMENT - SEE LAST PAGE

siderably less than atmospheric pressure. The boiled or strained product is then washed, and the water evaporated under medium or high vacuum, thus avoiding the use of the high temperature required under normal conditions and shortening to a minimum the time required for the boiling and drying process.

The resultant product is a finely divided loose fluffy powder, the property of which is its ability to absorb liquids and thereby becoming transformed into an excellent mashed potato. It requires no further cooking; all that is required is to mix it with 3 to 4 parts of hot water (or water and milk) when the product has all the appearance, taste and nutritive value of freshly cooked mashed potatoes. All the

natural salts, colour and aroma are retained. 20

The drying process under vacuum takes place from the interior cells to the outer parts, which is contrary to drying by hot air, and under atmospheric pressure, when the outer surface dries first, thus forming a skin which prevents the inner or core water escaping and evaporating. 25

Other vegetables can be treated in the same way as potatoes by mashing or cutting them in small pieces, boiling or steaming them in their natural moisture, or by adding and boiling in water and then drying under vacuum. 30

Dated this 14th day of September, 1938.
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COMPLETE SPECIFICATION

Improvements in and relating to the Treatment of Foodstuffs

I, GEORG WILHELM HOMMEL, of German nationality, of 57-59, Victoria Street, Westminster, London, S.W.1, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to the treatment of solid foodstuffs which are normally consumed in a boiled or otherwise cooked state and particularly to the treatment of vegetable foods and eggs. 45

The object of the invention is to provide a process of treating such foods with a view to obtaining a product which may be stored for long periods and will retain its nutritive and other properties, and in particular the properties due to the presence of vitamins in the material initially treated. 50

As is well known the vitamin content of food is liable to be reduced by the action of heat, the degree of destruction depending upon the temperature to which the material is treated and the time during which it is subjected to the action of heat. 55

Thus, Vitamin A is known to be affected in this way as also are Vitamins B and C, the latter of which is soluble in water. 60

The invention consists in a process of treating solid foodstuffs which comprises subjecting the foodstuffs to boiling or steaming operations effected under reduced pressure, subjecting the boiled or steamed mass of solid foodstuff so obtained to a drying operation under reduced pressure and during or subsequent to the boiling or steaming operations subjecting the solid foodstuff to irradiation with light rays in the visible and/or non-visible regions of the spectrum. 65 70 75

Thus, in accordance with the invention, these operations may be carried out under a pressure of 0.0728 atmospheres, the temperature of the material undergoing treatment being retained at 40° C. 80

Normally, in accordance with the invention, the material is subjected to the boiling or steaming and evaporation and irradiating treatments in a suitably divided state. 85

Thus, in the case of vegetables, they may be cut up into small pieces.

If the amount of water present in the raw food treated is sufficient, the boiling and steaming operation may be effected without the addition of water. 90

The irradiation is effected while the material is subjected to reduced pressure, and preferably during the boiling or steaming and evaporating operations. 95

Such irradiation may, for instance, be applied to increase the vitamin content of the material beyond that corresponding with the vitamin content of the material initially treated, or merely to replace that proportion of the vitamins or certain of the vitamins which may be destroyed during the boiling or steaming and evaporation treatments. 100

Conveniently, the visible rays included in the red to orange region of the spectrum are used for irradiation alone or in association with the light rays falling within other regions of the spectrum and including ultra-violet rays in greater or less proportions. 105 110

The irradiation will normally be effected by artificial light and, as a source of artificial light-giving rays in the red to orange region of the spectrum, the white light produced from incandescent lamps having tungsten filaments may be employed. 115

Alternatively, white light approaching more nearly the character of sunlight may be used.

5 Tungsten or other metallic conductors, heated to a degree such that they will emit rays within the orange to red region of the spectrum, may be used.

10 If it is desired to irradiate with ultra-violet light, electric lamps having envelopes of material highly permeable to these rays and, for instance, envelopes of quartz, may be used.

Thus, mercury-quartz lamps may be employed where it is desired to maintain 15 or raise the content of Vitamins B, C and D in the material.

As will be understood, mixtures of foods of various kinds may be treated in accordance with the invention to produce 20 preparations which may be readily prepared by the addition of water or other liquid.

The following particulars are given by way of example to illustrate the application of the invention to the treatment of 25 potatoes.

The potatoes are washed, peeled and then boiled or steamed at a pressure considerably less than atmospheric pressure. The boiled or strained product is then 30 mashed and the water evaporated under medium or high vacuum, thus avoiding the use of the high temperature required under normal conditions and shortening to a minimum the time required for the 35 boiling and drying process.

During the boiling or steaming, or during the drying operation, or alternatively both during the boiling or steaming, and during the drying operation the potatoes 40 are subjected to irradiation of the character previously specified.

Both during the boiling or steaming and drying operations, the temperature must be kept below that at which glutin- 45 isation sets in, that is to say, below a temperature of 55° C.

The resultant product is a finely divided loose fluffy powder, the property of which is its ability to absorb liquids and thereby 50 becoming transformed into an excellent mashed potato. It requires no further cooking; all that is required is to mix it with 3 to 4 parts of hot water (or water and milk) when the product has all the 55 appearance, taste and nutritive value of freshly cooked mashed potatoes. All the natural salts, colour and aroma are retained.

The drying process under vacuum takes 60 place from the interior cells to the outer parts, which is contrary to drying by hot air, and under atmospheric pressure, when the outer surface dries first, thus forming a skin which prevents the inner or core 65 water escaping and evaporating.

Other vegetables can be treated in the same way as potatoes by mashing or cutting them in small pieces, boiling or steaming them in their natural moisture, or by adding and boiling in water and 70 then drying under vacuum.

It may in conclusion be pointed out that in the Specification No. 279,487 there is described and claimed a process of 75 manufacturing food products which consists in treating vegetable material with a solution of alkali phosphates in the presence of ultra-violet rays, and at reduced pressure and substantially in the absence of free oxygen at moderate temperatures, 80 substantially not exceeding sixty degrees Centigrade, removing the liquor from the residue, and inspissating said liquor to the desired consistency.

Having now particularly described and 85 ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A process of treating solid foodstuffs 90 which comprises subjecting the foodstuffs to boiling or steaming operations effected under reduced pressure, subjecting the boiled or steamed mass of solid foodstuff so obtained to a drying operation under re- 95 duced pressure, and during or subsequent to the boiling or steaming operations subjecting the solid foodstuff to irradiation with light rays in the visible and/or non-visible regions of the spectrum. 100

2. A process as claimed in Claim 1, in which the said operations are carried out under a pressure of 0.0728 atmospheres, the temperature of the material undergoing 105 treatment being retained at 40° C.

3. A process as claimed in Claim 1 or Claim 2, in which the material is subjected to the boiling or steaming and evaporation and irradiating treatments in a suitably divided state. 110

4. A process as claimed in any of the preceding claims, in which the boiling or steaming operation is effected without the addition of water.

5. A process as claimed in any of the 115 preceding claims, in which the irradiation is applied to increase the vitamin content of the material beyond that corresponding with the vitamin content of the material initially treated. 120

6. A process as claimed in Claim 1, 2 or 3, in which the irradiation is applied merely to replace that proportion of the vitamins or certain of the vitamins which 125 may be destroyed during the boiling or steaming and evaporation treatments.

7. A process as claimed in any of the preceding claims, in which the visible rays included in the red to orange region 130 of the spectrum are used for irradiation

alone or in association with the light rays falling within other regions of the spectrum and including ultra-violet rays in greater or less proportion.

5 8. A process as claimed in any of the preceding claims, in which the irradiation is effected by artificial light.

9. A process as claimed in any of the preceding claims, in which, as a source of
10 artificial light-giving rays in the red to orange region of the spectrum, the white light produced from incandescent lamps having tungsten filaments is employed.

10. A process as claimed in any of the
15 preceding Claims 1 to 6, in which white light approaching the character of sun-

light is used.

11. A process as claimed in any of the preceding Claims 1 to 6, in which ultra-violet light is used from electric lamps
20 having envelopes of material highly permeable to those rays and, for instance, envelopes of quartz.

12. A process as claimed in Claim 11,
25 in which mercury-quartz lamps are employed for maintaining or raising the content of Vitamins B, C and D in the material.

13. Process of treating foodstuffs, substantially as hereinbefore described.

Dated this 11th day of October, 1939.

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ERRATA

SPECIFICATION No. 521,189.

Page 2, line 3, for "washed" read
"mashed"

Page 3, line 106, for "ars" read "as"

THE PATENT OFFICE,

July 4th, 1940.